Type locality — 5 km west of Portobelo (latitude 9° 30′ N; longitude 79° 42′ W), Panama. The specimens were all collected on February 15, 1975, by myself, in about 1 to 10 feet of water, under rocks or fragments of old coral resting on sand. They came from two collecting stations (AJF 222, and 223), about 1 km west of Portobelo (1 specimen, 5.5 mm long), and 5 km west of Portobelo (10 specimens, including the here designated holotype), respectively. The species is called *portobelensis* in reference to its type locality, Portobelo.

Further distribution — Another specimen of *Callistochiton portobelensis* was found by the author on April 28, 1975, while diving from aboard the *R/V Coral Reef* with the Steinhart Divers of the California Academy of Sciences, in 5 m of water by the Northwest Channel (latitude 24° 30′ N; longitude 81° 54′ W), off Key West, Florida. The specimen measures 9.0 mm in length. This finding extends the known range of *C. portobelensis* some 1,000 miles northward.

Discussion — *Callistochiton portobelensis* bears little resemblance to *C. shuttleworthianus*, the only member of the genus *Callistochiton* hitherto known in the Caribbean (KAAS, 1972). Instead, in size, color, general shape, sculpture of the tegmentum, and girdle scales, *C. portobelensis* is remarkably similar to *Callistochiton elenensis* (Sowerby, 1832) from the tropical eastern Pacific. Compared with randomly selected specimens from several lots of *C. elenensis* in my collection, *C. portobelensis* was found to differ by 1) its smaller size, 2) a much more subdued sculpturing of the valves, particularly of the radial ribs in valves i and viii, 3) a more rounded and smoother jugal area, 4) no "upswept" valves (see Thorpe in Keen, 1971:875), and 5) thicker longitudinal riblets, separated by narrower interspaces.

Still, the affinities between *C. portobelensis* and *C. elenensis* are so close as to make them sibling species. Likely, they evolved from the same parent population and became geographically isolated by the emergence of the isthmus of Panama in the Pliocene.

ACKNOWLEDGEMENTS

I wish to express my appreciation to Hans Bertsch of the Donner Laboratory, University of California, Berkeley, for the SEM microphotographs; and to the Steinhart Divers of the California Academy of Sciences, and to Beta Research Oceanographic Laboratories, for their assistance in several phases of this work. I wish further to give my thanks to Allyn G. Smith of the Department of Geology of the California Academy of Sciences for his valuable critical comments of the manuscript.

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A NEW FOSSIL *ASHMUNELLA* (PULMONATA: POLYGYRIDAE) FROM THE GUADALUPE MOUNTAINS NATIONAL PARK, TEXAS

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ABSTRACT

A new species of fossil polygyrid land snail, Ashmunella nana, *is described. The species is known only from deposits of Pleistocene age in the southern*

Guadalupe Mountains, Culberson County, Texas. An associated molluscan fauna in these deposits is recorded and remarks are made concerning Oreohelix socorroensis *Pilsbry.*

INTRODUCTION

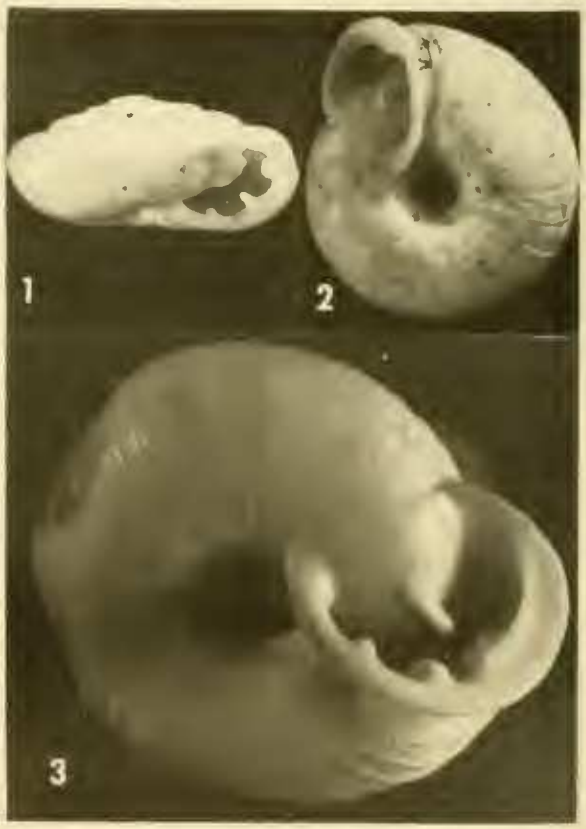
Pine Spring Canyon in the southern Guadalupe Mountains, Culberson County, Texas, has received considerable attention malacologically. It is the type locality of *Holospira montivaga breviara* Pilsbry, 1946, of *Holospira pityis* Pilsbry and Cheatum, 1951, and of *Ashmunella kochi amblya* Pilsbry, 1940. The canyon is now in a central position in the Guadalupe Mountains National Park.

Exposed in walls of Pine Spring Arroyo are thick alluvial deposits that contain fossil mollusks. On slopes of the canyon above the arroyo there are fossiliferous colluvial deposits. At the locality reported here, there are two strata of rubbly colluvium (to be referred to, hereafter, as "lower rubble" and "upper rubble") separated by reddish silt, containing scattered, subrounded stones. The rubble is predominantly of small, sharply angular limestone fragments of the type interpreted by Galloway (1970 : 245), in the Sacramento Mts. (120 km to the northwest, in New Mexico), to be periglacial deposits of frost rubble. It seems probable that the upper rubble was deposited during the latest Wisconsinan Glaciation. The reddish deposits probably represent a paleosol appertaining to an interstade or interglaciation and the lower rubble seemingly represents either an earlier Wisconsinan or still earlier time when periglacial conditions existed in the mountains.

The molluscan fauna found in the lower rubble comprises, among others listed below, *Ashmunella rhyssa* (Dall) and a new species, described below. Neither species is known to live in the Guadalupe Mts. at present and the latter seems to be an extinct species. *A. r. rhyssa* still flourishes in the Sacramento Mountains. In the upper rubble a different *Ashmunella*, *A. kochi amblya* Pilsbry, occurs. This species presently inhabits Pine Spring Canyon and other parts of the southern Guadalupe Mts. The sequence suggests that the two former species of *Ashmunella* became extinct in the Guadalupe Mts. between the times of deposition of the lower and upper rubbles and that *A. kochi amblya* appeared in the mountains during the time of the latest glaciation. [Vagvolgyi (1974 : 143) suggested that the subspecies *amblya* might better be synonymized with the nominal subspecies.]

Ashmunella nana *new species*
Figs. 1-3

Description of Holotype: Shell small (for genus), moderately depressed, 10.6 mm in diameter, 5.0 mm high; body whorl rounded peripherally and descending only slightly; umbilicus round, deep, contained 5.4 times in diameter; aperture obliquely oriented, 3.2 mm in oblique distance between inner corners of lip; aperture bearing four denticles; parietal



FIGS. 1, 2. *Holotype of* Ashmunella nana *new species (10.6 mm diameter).* FIG. 3. *Apertural view of paratype of* A. nana.

tooth oblique, simple, 1.7 mm long, .4 mm high; palatal tooth rectangular, 1.1 mm long and .5 mm high, basal lip with two teeth, both compressed, 1.0 mm apart, upper tooth rising .6 mm and lower tooth rising .2 mm above inner rim of lip; lip slightly expanded and recurved, grooved behind; first 1¼ whorls smooth, except for minute pits; succeeding whorls finely wrinkle-striate to last half of body whorl, which bears *ca.* 26 low but distinct ribs, better developed dorsally and progressively thicker distally; total number of whorls, 4.75. Etymology: *nana* = dwarf (L., fem., subst.).

Variation: For fifty paratypes from the type locality, the following measurements (mm) and proportions were obtained (mean outside parenthesis; range inside parenthesis); Diameter: 10.07(9.1-11.2); Height: 4.53(4.0-5.2); Diameter/Height: 2.21(1.98-2.47); Width of Umbilicus: 1.96(1.4-2.5); Diameter/Width of Umbilicus: 5.17(4.32-6.50); Length of Parietal Tooth: 1.51(1.2-1.8); Length of Palatal Tooth: 1.24(0.7-1.5); Number of Whorls: 4.86(4.6-5.25). All specimens observed had four denticles (except where exfoliated), which showed only minor variation in shape and size. There was variation in degree of ribbing, ranging from few ribs to specimens in which most or all of the body whorl bore ribs dorsally and peripherally. Measurements of four specimens taken *ca.* 60 m southeast of the type locality (see below) fell within the limits enumerated above.

Comparisons: A. nana is among the smallest of Ashmunellas. The only members of the genus reported to be as small are *A. proxima harveyi* Pilsbry (Pilsbry, 1940 : 959) with a specimen reported as being 10.3 mm in diameter and 5.0 mm high and *A. intricata* Pilsbry (Pilsbry, 1948 : 203) with specimens recorded as 9.6 and 10.6 mm in diameter and 4.7 and 4.8 mm high.

A. nana seems to bear little resemblance, conchologically, to any known species of *Ashmunella*, living or fossil, from the region east of the Rio Grande Valley. In general shape and in number and arrangement of denticles it resembles the *A. proxima* Pilsbry complex of the Chiricahua Mts., Arizona. However, *A. nana* is much less tightly whorled, less angular peripherally and is much more ribbed than members of the *proxima* complex. A close relationship with this distant group seems unlikely.

In contrast to *A. nana*, in regard to size, is *A. kochi amblya*, which may exceed diameters of 20 mm. Thus, one of the largest and one of the smallest of Ashmunellas have inhabited Pine Spring Canyon. *A. nana* seems to bear little relationship either to *A. kochi amblya* or to the other living species of the Guadalupe Mts., *A. edithae* Pilsbry and Cheatum and *A. carlsbadensis* Pilsbry. The wide, shallow umbilici of the latter three species are in marked contrast to the narrow, deep umbilicus of *A. nana*.

Type Locality: Texas, Culberson Co., Guadalupe Mts., Pine Spring Canyon, 3.2 km (2 mi.) WNW of village of Pine Springs. 104° 50′ 45″ W Long, 31° 54′ N Lat; 1912 m (6270 ft.) elevation. Deposits are exposed in banks of a small arroyo of high gradient, tributary, from the west, to the main arroyo of the canyon. Deposits occur *ca.* 30 m west (on east-facing slope) and up-slope from a right-angle bend in the main arroyo (changing from west to north, up-canyon). This sharp bend is .65 km (.4 mi.) south of the "H" in "Devil's Hall" (U.S.G.S. Guadalupe Peak, Texas, 15 min. topographic quadrangle, 1933).

Types: Holotype, Acad. Nat. Sci., Philadelphia 338703; Paratypes: ANSP 338704; Dallas Museum Nat. Hist. 4400; The Delaware Museum Nat. Hist. 100700; University of Arizona 17382; Museum of Arid Land Biol., U.T. El Paso 4165, 4170.

ASSOCIATED FAUNA

In association with *A. nana* and *A. r. rhyssa*, the following species of snails have been taken in the lower rubble: *Cochlicopa lubrica* (Müller), *Gastrocopta pilsbryana* (Sterki), *Pupilla sonorana* (Sterki), *Pupilla blandii* Morse, *Vallonia gracilicosta* Reinhardt, *Vallonia perspectiva* Sterki, a succineid, *Holospira montivaga breviara* Pilsbry, *Discus cronkhitei* (Newcomb), *Helicodiscus eigenmanni* Pilsbry, *Retinella indentata* (Say), *Hawaiia minuscula* (Binney), *Zonitoides arboreus* (Say), *Striatura meridionalis* (Pilsbry and Ferriss), *Vitrina pellucida alaskana* Dall, *Oreohelix socorroensis* Pilsbry and *Humboldtiana ultima* Pilsbry. Recent collecting by Fullington shows that all

these species except probably the *Oreohelix* still occur in the Guadalupe Mts. but several species now occur only at higher elevations.

Oreohelix socorroensis was taken in both the lower and upper rubble. It also occurs in alluvium along Pine Spring Canyon Arroyo. Probably specimens of *O. yavapai compactula* Cockerell reported by King (1948 : 145) were of this species. *O. socorroensis* has been found, as a fossil, in the Sacramento and San Andres Mts., New Mexico, and in the Franklin, Hueco and Guadalupe Mts., Texas. It still lives in the Gallinas Mts. in central New Mexico. It is surely allied to the *O. yavapai* Pilsbry complex of northern New Mexico and Arizona, especially to *O. yavapai neomexicana* Pilsbry. However, elucidation of relationships probably would involve a taxonomic revision of the entire *yavapai* group, a task not undertaken lightly.

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TENTACLE-BRANCHING IN THE PERIWINKLE, *LITTORINA LITTOREA*

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Abnormalities in mollusks have been noted by many observers and are the subject of a treatise by P. Pelseneer (1920). In gastropods, supplementary or multiple tentacles have been noted in several cases, but, as Pelseneer noted, they are more common on one side than the other. Branching has been particularly noted in *Littorina*. Pelseneer's own observations may be summarized as follows:

Jeffreys (1862) noted a specimen of *L. littorea* which had two tentacles branched. He also commented in reference to a supplementary tentacle observed in a specimen of *L. obtusata*, that the *extra* tentacle is not far removed from the normal one.

Hanko (1912) in a paper delineated the varieties of tentacle-branching which have been observed in *Nassarius mutabilis* (L.).

Crabb (1927) studied forked tentacles in the pond snails *Physa gyrina* and *Lymnaea stagnalis appressa*.

Wong and Wagner (1956) reported on the effect of ultraviolet light on the tentacles (among other things) of *Oncomelania nosophora* and *O. quadrasi*. Exposure to ultraviolet light causes *abnormal growth structures* in many individuals of these species. However, abnormal tentacles tended to be lost over a period of time.

Davis, Moose & Williams (1965) described a specimen of a hybrid *Oncomelania* with tentacle abnormalities and stated "It is known that the tentacles of *Oncomelania* are prone to abnormal branching." The authors suggested that inheritance might be involved in tentacle branching.

Richards (1969) in an important paper showed that inheritance appears to play a part in tentacle branching of the freshwater pulmonate mollusk *Biomphalaria glabrata*.

While observing 50 living periwinkles which had been selected for experimental purpose from near the low tide mark of the intertidal region of Northwest Harbor, Deer Isle, Maine, the summer of 1971, the writer noticed one specimen with a bifurcated tentacle (fig. 1). Subsequently, four collections of periwinkles, consisting of 1,026 living specimens were examined with the following results: